PMC-EF2a

(2.04.02)

U.S. DEPARTMENT OF ENERGY
EERE PROJECT MANAGEMENT CENTER
NEPA DETERMINATION

RECIPIENT: Montana Tech of The University of Montana **STATE:** MT

PROJECT TITLE: Recovery Act: A Demonstration System for Capturing Geothermal Energy from Mine Waters beneath Butte, Montana; Topic Area 1-Technology Demonstration Project

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0000116	DE-EE0002821	GFO-0002821-002	GO2821

Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Order 451.1A), I have made the following determination:

CX, EA, EIS APPENDIX AND NUMBER:
Description:

A9 Information gathering, analysis, and dissemination	Information gathering (including, but not limited to, literature surveys, inventories, site visits, and audits), data analysis (including, but not limited to, computer modeling), document preparation (including, but not limited to, conceptual design, feasibility studies, and analytical energy supply and demand studies), and information dissemination (including, but not limited to, document publication and distribution, and classroom training and informational programs), but not including site characterization or environmental monitoring. (See also B3.1 of appendix B to this subpart.)
B2.1 Workplace enhancements	Modifications within or contiguous to an existing structure, in a previously disturbed or developed area, to enhance workplace habitability (including, but not limited to, installation or improvements to lighting, radiation shielding, or heating/ventilating/air conditioning and its instrumentation, and noise reduction).
B5.19 Ground source heat pumps	The installation, modification, operation, and removal of commercially available smallscale ground source heat pumps to support operations in single facilities (such as a school or community center) or contiguous facilities (such as an office complex) (1) only where (a) major associated activities (such as drilling and discharge) are regulated, and (b) appropriate leakage and contaminant control measures would be in place (including for cross-contamination between aquifers); (2) that would not have the potential to cause significant changes in subsurface temperature; and (3) would be located within a previously disturbed or developed area. Covered actions would be in accordance with applicable requirements (such as local land use and zoning requirements) in the proposed project area and would incorporate appropriate control technologies and best management practices.

Rational for determination:

Montana Tech would install a large centralized hybrid ground source heat pump (GSHP) system using off-the-shelf technology to reduce operating costs of the 57,000 square foot Natural Resources Building. The Natural Resources Building currently uses steam heat from a central campus boiler system and is supplied by an air-cooled 169-ton chiller; however, the building was constructed to accommodate heat pumps with two 6-inch pipe stub-outs leading to the attic where the air handling units are located. The GSHP system would be a water-to-water type at a nominal 60 tons. The system would utilize heat pumps and mine water from the abandoned Orphan Boy Mine located approximately 1200 feet away from the building. Commercialization of the technology would be promoted. The Natural Resources Building is located at 1505 West Park Street in Butte, Montana.

Phase 1 (all tasks) and Phase 2 (Task 2.1) were previously approved by GFO-10-228 on March 23, 2010. This NEPA determination is specific to Phase 2 (Tasks 2.2 and 2.3), Phase 3 (all tasks), and Project Management and Reporting.

PHASE 2: CONSTRUCTION
2.2 Installation and Commissioning of the Heat Pump System
2.3 Installation of Additional Access to the Stope.
PHASE 3: OPERATION, DATA COLLECTION, OUTREACH, AND REPORTING
3.1 Data Collection and Reporting
3.2 Education and Outreach
Project Management and Reporting

Access to the mine was originally proposed through the Orphan Boy vertical shaft with the associated equipment installed on top of the mine shaft and would have required removal of the ventilation fan assembly that remains at the shaft collar. The fan assembly was found to be eligible for listing in the National Register and removal would have constituted an adverse effect. The original proposal was modified to avoid effects to the fan assembly. Montana Tech's mining engineering department is proceeding with a privately funded underground development project to construct a decline shaft starting at the surface about 800 feet North-East of Orphan Boy which will intersect the Orphan Boy Mine at the West end of the decline at the 100-foot level cross-cut. The purpose of this separate project is

to clear the haulage level connecting the Orphan Girl and Orphan Boy mines. The DOE funded project would utilize this decline shaft to enable installation of the heat pumps and associated equipment in underground mine workings, rather than on the surface, thereby negating the need to remove the ventilation fan assembly. Montana SHPO concurred with a finding of "no adverse effect" to the fan assembly on April 4, 2012.

Piping would be run from a point about 100 feet outside of the Natural Resources Building to the Orphan Boy mine shaft through a previously disturbed area. Approximately 700 feet of piping and associated trenching would be needed if the pipes are run through the planned decline. If the decline is not used, 1200 feet of trenching would be required. The trench would be 4-6 feet deep and 2-4 feet wide and would be excavated to meet OSHA rules. A storm water management plan and erosion control plan will be in place prior to initiation of construction activities. Original grade will be restored and the disturbed area will be planted with an appropriate seed mixture or native plants.

Geothermal Heat Exchange equipment would be located within the Orphan Boy Mine shaft. Piping between the mine shaft and the Natural Resources Building would carry only the working fluid for the GSHP system, which is municipal water with no anti-freeze solution added. No mine waters would be pumped out of the mine itself.

Remaining project budget: $1,000,000 (DOE); $1,009,414 (cost share)

Remaining tasks of this project are composed of information gathering, analysis, and dissemination; workplace enhancements; and ground source heat pumps; therefore the DOE has categorized this proposal into Categorical Exclusions A9, B2.1, and B5.19.

NEPA PROVISION

DOE has made a final NEPA determination for this award

Insert the following language in the award:

Note to Specialist :

EF2a prepared by Casey Strickland

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: _____ Date: 4/18/2012

NEPA Compliance Officer

FIELD OFFICE MANAGER DETERMINATION

☐ Field Office Manager review required

NCO REQUESTS THE FIELD OFFICE MANAGER REVIEW FOR THE FOLLOWING REASON:

☐ Proposed action fits within a categorical exclusion but involves a high profile or controversial issue that warrants Field Office Manager's attention.

☐ Proposed action falls within an EA or EIS category and therefore requires Field Office Manager's review and determination.

BASED ON MY REVIEW I CONCUR WITH THE DETERMINATION OF THE NCO :

Field Office Manager's Signature: _____ Date: _____

Field Office Manager